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FACSIMILE TRANSMITTAL

DATE: January 9, 2006

TO: Commissioner of Patents

FAX 571-273-8300

FROM: Joel R. Meyer

PAGES: 13 (including cover)

RE: U.S. Patent Application No. 09/587,493

FILED June 2, 2000

FOR: USING CLASSIFICATION TECHNIQUES IN DIGITAL WATERMARKING

ART UNIT: 2136

DOCKET NO.: 60049

✓ Urgent ☐ For Review ☐ Please Reply

FACSIMILE COVER LETTER

Attached is a Request for Reinstatement of the Appeal, Supplemental Appeal Brief and Transmittal Letter with deposit account authorization for the above referenced application.

CERTIFICATE OF FAXING

I hereby certify that these papers are being facsimile transmitted to the US Patent Office, 571-273-8300 on January 9, 2006.

Joel R. Meyer, Reg. No. 37,677
Attorney for Applicant

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Hugh L. Brunk
Application No.: 09/587,493

Filed: June 2, 2000

For: USING CLASSIFICATION TECHNIQUES IN DIGITAL WATERMARKING

Examiner: C. Colin

Date: January 9, 2006

Response Under 37 CFR § 1.116
Expedited Procedure
Art Unit: 2136

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Joel R. Meyer, Reg. No. 37,677
Attorney for Applicant

TRANSMITTAL LETTER

MAIL STOP APPEAL BRIEF – PATENTS
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Enclosed for filing in the above-captioned matter are the following:

☒ Request for Reinstatement of the Appeal

☒ Supplemental Appeal Brief

☒ Applicant petitions for a two month extension of time from November 9, 2005 to January 9, 2006. (fee **$450.00**)

☒ Please charge **$450.00** (fee for Extension of time) and any additional fees which may be required in connection with filing these documents and any extension of time fee, or credit any overpayment, to Deposit Account No. 50-1071.

Respectfully submitted,

Date: January 9, 2006

DIGIMARC CORPORATION

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Attorney for Applicant

REQUEST FOR REINSTATEMENT OF THE APPEAL

MAIL STOP APPEAL BRIEF-PATENTS
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

Applicant hereby requests reinstatement of the appeal and submits a supplemental appeal brief herewith. An amendment after final was previously filed with the first Appeal Brief on April 25, 2005, but there is no indication that this amendment was entered.

Respectfully submitted,

Date: January 9, 2006

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PATENT
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Joel R. Meyer, Reg. No. 37,677
Attorney for Applicant

SUPPLEMENTAL APPEAL BRIEF

MAIL STOP APPEAL BRIEF-PATENTS
COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

This supplemental brief is in furtherance of the Notice of Appeal filed January 24, 2005, and further in response to the Office Action dated August 9, 2005, which re-opened prosecution in response to the Appeal Brief filed April 25, 2005. If necessary, please charge the fee required under 37 CFR 41.20 or any deficiency thereof to deposit account 50-1071 (see transmittal letter).

JRM:lmp 1/9/06

PATENT
Attorney's Matter No. 60049

I REAL PARTY IN INTEREST

The real party in interest is Digimarc Corporation, by an assignment from the inventor recorded at Reel 011196, Frames 0576-0577, on October 4, 2000.

II RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-20 stand rejected and appealed. The claims have been rejected in the Office Action dated August 9, 2005, which re-opened prosecution after the Appeal Brief filed April 25, 2005. Applicant requests reinstatement of the appeal and submits this supplemental Appeal Brief.

IV. STATUS OF AMENDMENTS

An amendment after final was filed with the Appeal Brief submitted on April 25, 2005, to make changes to claims 4 and 5 that were inadvertently omitted from the response to the Action dated November 17, 2003. The Office has not indicated whether this amendment after final has been entered. Claims 4 and 5 are not argued separately; and therefore, the entry of this amendment should not affect the appeal.

V. SUMMARY OF CLAIMED SUBJECT MATTER

As set forth in claim 1, one aspect of the invention is a method for reading a digital watermark in a media signal. This method assigns sets of media signal samples into classes, computes a statistical distribution of the classes, and uses the statistical distribution to detect or read a watermark in the media signal. See, for example, page 2, lines 3-8, Fig. 1 and text at page 4, line 24 to page 5, line 12, and Fig. 4 and text at page 12, line 1, to page 17, line 8.

As set forth in claim 7 using the statistical distribution may include assigning a figure of merit to a sample indicating a likelihood that the sample includes a recoverable portion of a

watermark signal, and using the figure of merit in a read operation. See, for example, page 2, lines 19-26.

As set forth in claim 8, assigning a figure of merit may include assigning a weight to the sample indicating an extent to which the sample is likely to reflect valid watermark data. See, for example, page 2, lines 24-26, and page 14, lines 12-15.

As set forth in claim 9, using the statistical distribution may include assigning a figure of merit to a sample indicating a likelihood that the sample includes a recoverable portion of a watermark signal, and using the figure of merit in a watermark decoding operation. See, for example, page 2, lines 19-26.

As set forth in claim 10, assigning a figure of merit may include assigning a weight to the sample indicating an extent to which the sample is likely to reflect valid watermark data. See, for example, page 2, lines 24-26, and page 14, lines 12-15.

As set forth in claim 12, another aspect of the invention is a method for reading a digital watermark in an image. This method assigns transformed samples of the image into classes using characteristics computed from the samples to group the samples into the classes. The method models a statistical distribution of the samples in each of the classes, and uses the statistical model to decode a watermark from the samples. See, for example, page 2, lines 27-30, Fig. 1 and text at page 4, line 24 to page 5, line 12, and Fig. 4 and text at page 12, line 1, to page 17, line 8.

As set forth in claim 13, the characteristics may comprise signal activity of the samples. In claim 13 method, the signal activity of the samples is evaluated and the samples are assigned to the classes based on signal activity. See, for example, page 4, lines 15-20, and page 9, lines 23-26.

As set forth in claim 15, another aspect of the invention is a method for reading a digital watermark in a watermarked signal. This method assigns samples of the watermarked signal into classes using characteristics computed from the samples to group the samples into the classes. The method computes a statistical distribution of the samples in each of the classes, and uses the statistical distribution to decode a watermark from the watermarked signal. See, for example,

page 3, lines 1-4, Fig. 1 and text at page 4, line 24 to page 5, line 12, and Fig. 4 and text at page 12, line 1, to page 17, line 8.

As set forth in claim 16, sets of samples may be assigned to classes based on a signal characteristic of the samples in the sets. See, for example, page 2, lines 9-13. As set forth in claim 17, the signal characteristic may be a measure of signal energy. See, for example, page 2, lines 9-13, and page 12, lines 11-25.

As set forth in claim 19, another aspect of the invention is a method for estimating a watermark signal from a media signal suspected of containing the watermark signal. This method assigns samples of the suspect signal into classes based on a signal characteristic of the samples, models distributions of the classes, and estimates the watermark signal based on the suspect signal, the distributions of the classes, and a distribution of the watermark signal. See, for example, page 3, lines 5-11, and page 15, line 11 to page 17, line 9.

The cited passages are examples only, not intended to limit the scope of the invention.

VI. GROUNDS OF REJECTION TO BE REVIEWWED ON APPEAL

- Claims 1-18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,108,434 to Cox et al. ("Cox").
- Claims 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of U.S. Patent No. 6,553,127 to Kurowski ("Kurowski").

VII. ARGUMENT

Claims 1-18 are not anticipated by Cox

Claim 1

Cox fails to disclose, teach or suggest "computing a statistical distribution of the classes; and using the statistical distribution to detect or read a watermark in the media signal" in the novel combination recited in claim 1.

Cox discloses a digital watermarking method that operates on blocks of DCT domain coefficients. Cox notes that a problem with such methods is that small geometric changes in an image or video signal significantly effects the DCT coefficients as explained at col. 3, lines 12-

25. Cox addresses this problem by approximating the scale change or distortion by spatially varying the translation of each 8 by 8 DCT block. Cox divides an image into sets of blocks, shifts the data 64 ways (0 to 7 pixel shifts in both X and Y dimensions, which results in 8 shifts in each direction), and then finds the shift that corresponds to the highest correlation to a watermark.

This process does not include "computing a statistical distribution of the classes." Moreover, since Cox does not compute such a statistical distribution, Cox also fails to teach or suggest "using the statistical distribution to detect or read a watermark in the media signal."

Claim 12

Cox fails to disclose, teach or suggest "modeling a statistical distribution of the samples in each of the classes; and using the statistical model to decode a watermark from the samples" in the novel combination of claim 12. Cox refers to testing the maximum value of a correlator output for statistical significance, but this does not correspond to "modeling a statistical distribution of the samples in each of the classes" as claimed. Cox fails to describe any modeling of a statistical distribution.

Claim 13

Cox fails to disclose, teach or suggest assigning samples into classes based on signal activity for modeling a statistical distribution and using the statistical model to decode a watermark from the samples. Cox divides an image into a disjoint set of blocks. This division is not "based on signal activity" as claimed. Cox refers to each block in a set experiencing the same translation, but this translation is unrelated to the claimed signal activity.

Claim 15

Cox fails to disclose, teach or suggest: "computing a statistical distribution of the samples in each of the classes; and using the statistical distribution to decode a watermark from the watermarked signal" as claimed.

Claim 17

Cox fails to disclose, teach or suggest a measure of signal energy for use in computing a statistical distribution that is used to decode a watermark as claimed.

Claims 12-20 are patentable over Cox in view of Kurowski

Claim 12

Cox and Kurowski fail to disclose, teach or suggest "modeling a statistical distribution of the samples in each of the classes; and using the statistical model to decode a watermark from the samples" in the novel combination of claim 12. Kurowski's detector only attempts detection in blocks that satisfy a detection criterion. The criterion and computation of it do not correspond to the claimed, "modeling a statistical distribution of the samples in each of the classes." Kurowski uses the criterion to select blocks for detection. Like Cox, Kurowski fails to teach or suggest modeling a statistical distribution as claimed. Since the combined teachings fail to teach all of the elements of claim 12, this claim is patentable over these teachings.

Claim 15

Cox and Kurowski fail to disclose, teach or suggest: "computing a statistical distribution of the samples in each of the classes; and using the statistical distribution to decode a watermark from the watermarked signal" as claimed.

Claim 19

Cox and Kurowski fail to disclose, teach or suggest estimating a watermark from a media signal suspected of containing a watermark, including: estimating the watermark signal based on the suspect signal, the distributions of the classes, and a distribution of the watermark signal.

VIII. CONCLUSION

For the foregoing reasons, the final rejection of the claims should be reversed. The dependent claims not mentioned above include additional elements that distinguish them from the cited art. These elements are not belabored here because they form part of dependent claims that patentable for the reasons already associated with base claims referenced above.

Respectfully submitted,

Date: January 9, 2006

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JRM:lmp 1/9/06

PATENT
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CLAIMS APPENDIX
Appealed Claims

1. A method for reading a digital watermark in a media signal comprising:
assigning sets of media signal samples into classes;
computing a statistical distribution of the classes; and
using the statistical distribution to detect or read a watermark in the media signal.

2. The method of claim 1 wherein the media signal is an audio signal.

3. The method of claim 1 wherein the media signal is an image signal.

4. The method of claim 3 wherein the media signal samples are expressed in a frequency domain.

5. The method of claim 4 wherein the media signal samples are spatial frequency coefficients.

6. The method of claim 1 wherein the samples are in a spatial or temporal domain.

7. The method of claim 1 wherein using the statistical distribution includes:
assigning a figure of merit to a sample indicating a likelihood that the sample includes a recoverable portion of a watermark signal; and using the figure of merit in a read operation.

8. The method of claim 7 wherein assigning a figure of merit includes assigning a weight to the sample indicating an extent to which the sample is likely to reflect valid watermark data.

9. The method of claim 1 wherein using the statistical distribution includes:

assigning a figure of merit to a sample indicating a likelihood that the sample includes a recoverable portion of a watermark signal; and using the figure of merit in a watermark decoding operation.

10. The method of claim 9 wherein assigning a figure of merit includes assigning a weight to the sample indicating an extent to which the sample is likely to reflect valid watermark data.

11. A computer readable medium on which is stored software for performing the method of claim 1.

12. A method for reading a digital watermark in an image comprising:

assigning transformed samples of the image into classes using characteristics computed from the samples to group the samples into the classes;

modeling a statistical distribution of the samples in each of the classes; and

using the statistical model to decode a watermark from the samples.

13. The method of claim 12 wherein the characteristics comprise signal activity of the samples, and the signal activity of the samples is evaluated and the samples are assigned to the classes based on signal activity.

14. A computer readable medium on which is stored software for performing the method of claim 12.

15. A method for reading a digital watermark in a watermarked signal comprising:

assigning samples of the watermarked signal into classes using characteristics computed from the samples to group the samples into the classes;

computing a statistical distribution of the samples in each of the classes; and

using the statistical distribution to decode a watermark from the watermarked signal.

16. The method of claim 15 wherein sets of samples are assigned to classes based on a signal characteristic of the samples in the sets.

17. The method of claim 16 wherein the signal characteristic is a measure of signal energy.

18. A computer readable medium on which is stored software for performing the method of claim 15.

19. A method for estimating a watermark signal from a media signal suspected of containing the watermark signal, the method comprising:

assigning samples of the suspect signal into classes based on a signal characteristic of the samples;

modeling distributions of the classes; and

estimating the watermark signal based on the suspect signal, the distributions of the classes, and a distribution of the watermark signal.

20. A computer readable medium on which is stored software for performing the method of claim 19.

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EVIDENCE APPENDIX

There is no evidence appendix.

RELATED PROCEEDINGS APPENDIX

There is no related proceedings appendix.